

the latter oblong ; a large purplish-brown patch on the costa near the base, its outer margin continued in a brown sinuous line to the hinder margin ; a smaller spot at the middle, its inner edge connected with a transversal sinuous line which touches the inner side of the reniform ; a small spot on costa beyond the middle, continued into a discal sinuous transverse line which skirts the outer edge of a large spot in the disk ; this is followed by a similar line and a submarginal line ; the marginal space inside these two last-mentioned lines black, with a green space running through the lower half ; marginal lunules green : hind wings purple-brown, paling towards the base, with some green submarginal spots and indications of a central band ; cilia of both wings brown, with green spots on fore wings and whitish spots on hind wings : abdomen brown, with green dorsal scales. Underside brown ; fore wings with some whitish marks on the costa ; the space below the median vein whitish and indications of two discal bands on both wings, and a lunular mark at the end of the cell of hind wings ; abdomen and legs ochreous grey ; tarsi brown, spotted with white ; fore legs covered with bright green hairs.

Expanse of wings  $1\frac{7}{10}$  inch.

Jaintia Hills, Assam.

Nearest to *virens*, Butler.

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XII.—*New American Hymenoptera, mostly of the Genus*  
*Nomada*. By T. D. A. COCKERELL.

*Ichneumonidæ*.

*Porizon Vierecki*, sp. n.

♂.—Length about 9 millim. ; wings about  $5\frac{1}{2}$  millim.

Head black, with the orbital margins broadly, the mandibles except tips, and a small triangle on each antero-lateral margin of clypeus yellowish white ; eyes purplish ; black area above clypeus strongly punctured, with a central rounded eminence ; scape swollen, pale ; tinged with ferruginous ; flagellum long, very dark brown ; antennæ 41-jointed ; thorax black, closely punctured ; mesothorax shining, with subdorsal longitudinal depressions ; tegulæ white ; meta-thorax areolate with raised lines. Wings strongly milky, iridescent, nervures white ; stigma triangular, very dark

brown, its extreme base white; coxæ and trochanters white marked with black. Femora ferruginous, anterior ones with a white stripe; anterior and middle tibiæ pale reddish, with a white stripe; hind tibiæ blackish, with more or less of a white stripe; spurs white, middle tibiæ with two spurs; tarsi whitish, black or nearly so at tips; first abdominal segment black, grooved laterally, its extreme hind margin slightly ferruginous; second segment dorsally black, with its apical margin broadly red; beneath, the segment is yellowish white; remaining segments bright orange-ferruginous.

*Hab.* Arroyo, 10 miles west of La Luz, New Mexico, at light, Aug. 23 (*C. H. T. Townsend*).

I sent some account of this insect to Mr. H. L. Viereck, who was kind enough to look it up in the Cresson collection. He reports it very like *Porizon hyalinipennis*, Cresson, from Texas. It will be known from *P. hyalinipennis* by the paler markings, very milky wings, and clypeus largely black. These insects differ from typical *Porizon* by not having the femora or tibiæ swollen and having the basal joint of hind tarsus slightly longer than the two following ones united. The hind tibia is very much longer than the basal joint of hind tarsi. The eyes are oval, their anterior margins almost parallel.

### Ceratinidæ.

#### *Ceratina Titusi*, sp. n.

♀.—Length about  $8\frac{1}{2}$  millim. (the type specimen has the head thrust forward, and so appears longer).

Head, thorax, and legs black, the only metallic colour being a slight greenish tint on prothorax, hind border of mesothorax, postscutellum, and metathorax; a longitudinal mark on middle of clypeus, narrow and sharply pointed above, a narrow stripe on anterior orbits up to level of antennæ, its inner edge very irregular, and a stripe behind each eye pale reddish (possibly yellow altered by cyanide); abdomen black, with a hardly perceptible greenish tint; antennæ black, flagellum pruinose. Tegulæ shining very dark brown, with lighter margins. Wings strongly infuscated, nervures and stigma very dark brown; second submarginal cell narrowed above, third very broad above. Head and thorax strongly punctured; mesothorax with the usual smooth space and five impressed lines; basal margin of metathorax shining, with numerous little ridges, but the greater part of the basal area dull and microscopically tessellate; abdomen with the first segment smooth, the second and third strongly punctured,

the others rugose. Pubescence white (except on tarsi behind, where it is orange), quite abundant on hind legs, pleura, and sides of metathorax. Mouth-parts greatly elongated; galea about 6 millim., second joint of labial palpus fully 4 millim., the third and fourth joints extremely minute; maxillary palpi six-jointed, the first joint long, stout, and dark-coloured, the last four short and subequal, these palpi not enlarged; mandibles black, bidentate at apex, produced into a tubercle outwardly near base and into a tooth beneath. Legs ordinary; spurs of hind tibiæ black, one longer than the other.

*Hab.* Bartica, British Guiana, May 21, 1901 (*R. J. Crew*).

Sent by Mr. E. S. G. Titus, and named after him in recognition of his work on bees. Allied to *C. pubescens*, Smith, but differs in the colour of the wings and thorax.

*C. Titusi*, by reason of the greatly produced mouth-parts and the peculiar mandibles, will form the type of a new subgenus, which may be called *Crewella*.

*Ceratina Crewi*, sp. n.

♀.—Length slightly over 7 millim.

Shining dark blue-green (Prussian green), the clypeus with a large, upright, wedge-shaped, cream-coloured mark, but no light colour on orbital margins or cheeks; antennæ short, black, flagellum slightly reddish beneath; head and thorax strongly punctured, mesothorax with the punctures small and close; a rather small, more or less U-shaped, smooth area; extreme base of metathorax longitudinally plicatulate; pleura with short white hair; tegulæ shining very dark brown; wings subhyaline, dusky, nervures dark, stigma narrow, second submarginal cell much contracted above; legs black, the femora more or less bluish, hind femora keeled and subangulate beneath; extreme tips of tarsi ferruginous; abdomen with the first segment smooth except on the apical middle, where it is roughened; second to fourth segments punctured, the punctures smallest and closest on second, largest on fourth; fifth and apical segments rugose.

*Hab.* Bartica, British Guiana, May 21, 1901 (*R. J. Crew*).

Sent by Mr. Titus. Closely related to *C. dupla*, Say, but the scutellum is much more closely punctured in the middle than in that species, and there are other differences in detail.

At Georgetown, British Guiana, March 28, 1901, Mr. Crew took a specimen of *Ceratina bicolorata*, Smith, a species hitherto recorded only from Brazil.

## Nomadidæ.

*Nomada erythrochroa*, sp. n.

♀.—Length about  $8\frac{1}{2}$  millim.

Rather light orange-ferruginous, without black or yellow markings; abdomen rather elongated, subfusiform, very minutely yet distinctly punctured. Distinguished from the allied species by the following combination of characters:—Mandibles simple; third joint of antennæ shorter than fourth, but more than half its length; flagellum wholly ferruginous; mesothorax dull, the punctures as close as is possible; scutellum prominent, conspicuously bilobed. Wings smoky, with the usual light spot; stigma dark ferruginous; nervures piceous; second submarginal cell very broad above; third submarginal cell greatly narrowed above, less than half width of second on marginal nervure. Tegulæ large, ferruginous, punctured. Sides of metathorax with conspicuous white hair.

*Hab.* Pasco, Washington State, May 25, 1896 (*Trevor Kincaid*).

*Nomada Grayi*, sp. n.

♀.—Length about 9 millim.

Similar in form and colour to *N. erythrochroa*, but a little duller, with the front, region of ocelli, sides of prothorax, median stripe on mesothorax, large hourglass-shaped mark on metathorax, very broad band from wings to middle and hind coxæ, all the coxæ behind except at apex, spot at extreme base of first four femora beneath, posterior part of cheeks, and extreme base of first abdominal segment all *black*. The only yellow about the insect is a rather large spot on each side of the second abdominal segment. Mandibles bidentate. Third antennal joint as long as fourth or nearly so; antennæ wholly ferruginous. Wings fairly clear, the apex dusky; stigma dark ferruginous, nervures piceous, second submarginal cell little narrowed above. Cheeks and sides of metathorax with conspicuous white hair. Tegulæ light amber-colour.

*Hab.* Corvallis, Oregon, May 7, 1898.

Received from Mr. H. L. Viereck. Named after Capt. Robert Gray, the explorer.

*Nomada Clarkii*, sp. n.

♀.—Length about  $9\frac{1}{2}$  millim.

Form ordinary, with oval abdomen, which is extremely

finely punctured; rather dark ferruginous, with a curved stripe beneath each antenna, a large patch above antennæ, joining a patch enclosing ocelli, cheeks behind, sides of prothorax, space behind tubercles, area between wings and the four hind coxæ, coxæ behind except at apex, extreme base of first four femora and underside of hind femora, stripe on mesothorax, broad in front, area on each side of scutellum and sutures between scutellum and mesothorax and post-scutellum, median stripe on metathorax, base of first abdominal segment, suffused spots at sides of first three segments near hind margin, and three bands on ventral surface of abdomen, not reaching sides, all *black*. There is no yellow about the insect. Antennæ wholly ferruginous. Mandibles simple. Tegulæ reddish amber. Wings moderately dark, stigma dark ferruginous, nervures piceous, second submarginal cell very broad above. First joint of anterior tarsi with a rounded excavation on the underside near the base, its proximal side produced into a sort of tooth, which is larger than in some allied species.

*Hab.* Corvallis, Oregon, April 6.

Received from Mr. H. L. Viereck. Named after William Clark, the explorer.

*Nomada Fowleri*, sp. n.

♀.—Length about  $8\frac{1}{2}$  millim.

Form ordinary, abdomen long-oval; head and thorax black, quite densely clothed with pale brownish-grey or dirty white hair; facial quadrangle broader than long; narrow anterior margin of clypeus and mandibles dull ferruginous; mandibles simple, rather strongly curved; the only yellow about the insect is a small patch at the extreme lower corners of face, next to the eyes; scape black; flagellum black above, bright ferruginous beneath; third antennal joint long, almost or quite as long as fourth; scutellum neither prominent nor bilobed; tegulæ shining ferruginous, not punctured. Wings dusky, especially on apical margin, the light spot neither conspicuous nor well defined; nervures and stigma piceous; second submarginal cell very broad above, third narrowed almost to a point. Legs ferruginous, the coxæ and trochanters, the anterior femora more or less behind, the middle and hind femora at base in front, and behind except at apex, and a stripe on the outside of the anterior and middle tibiæ *black*; middle and hind tarsi blackish, the tips of the joints red; hair on inner side of basal joint of hind tarsi very pale golden; abdomen dark chestnut-red above and below, basal half of



first segment black, the red intruding into the black as a double notch.

*Hab.* Corvallis, Oregon, April 15, 1897.

Received from Mr. Viereck. Named after Mr. C. Fowler, who has revised the Californian species of *Nomada*.

*Nomada Lewisi*, sp. n.

♀.—Length 8 millim.

Form ordinary; ferruginous, the extreme lower corners of face, a very small spot on each side of first abdominal segment (sometimes absent), a large spot on each side of second and third segments (often with a minute spot adjacent on the inner side), two spots and a band or four spots on fourth segment, and two spots on fifth segment *bright yellow*; patch enclosing ocelli, hindmost part of cheeks, spot on sides of prothorax, stripe on mesothorax, stripe on metathorax, stripe from wings to middle coxæ, middle femora beneath at base, and hind femora and tibiæ behind suffusedly, all *black*. Mandibles simple; hair of face white in the middle, golden at sides; antennæ entirely red, third joint barely shorter than fourth; mesothorax dull and extremely closely punctured; scutellum not noticeably bilobed; tubercles and tegulæ reddish amber. Wings smoky, the pale patch distinct; stigma ferruginous; nervures piceous; second submarginal cell much broader above than third. Hair on inner side of basal joint of hind tarsi mouse-colour; abdomen with minute close inconspicuous punctures, its first joint without any black, its ventral surface without markings.

*Hab.* Corvallis, Oregon, May 7, June 5; three specimens.

Received from Mr. Viereck. Named after Meriwether Lewis, the explorer.

*Nomada oregonica*, sp. n.

♀.—Length 7–8 millim.

Form ordinary; dark ferruginous, a very minute mark at each lower corner of face, a spot on each side of second, third, and fourth abdominal segments (sometimes only on the second, or on the third and fourth and nearly obsolete on the second), two faintly indicated discal spots on the fifth, and two or four small spots on the ventral surface near the end *yellow*; pattern of black markings as in *N. Lewisi*, but there are *three black stripes on the mesothorax*, the outer ones occasionally failing posteriorly, and the base of the first abdominal segment is black; on the underside of the abdomen there are often three

transverse stains, not amounting to distinct black bands; mandibles simple; flagellum entirely ferruginous; third antennal joint not very much shorter than fourth; head transversely oval; mesothorax very densely punctured; tegulae yellowish ferruginous, well punctured. Wings moderately smoky; stigma very dark ferruginous, nervures piceous. Scutellum not obviously bilobate; abdomen practically impunctate.

Very similar to *N. Sayi*, Rob., of the Eastern States.

♂.—Length about  $6\frac{1}{2}$  millim.

Head and thorax black instead of ferruginous; antennae long, flagellum black above; narrow anterior margin of clypeus, lower corners of face, and mandibles except tips dull reddish yellow; labrum the same colour, with the middle blackish; tubercles with a reddish spot, but no other marks on thorax, which is quite hairy; abdomen with a black mark on each side of second segment near base; yellow spots on sides of second, third, and fourth segments, and subdorsally on fifth and sixth; apex strongly emarginate; on the ventral surface basally is a large obcordate black patch. The anterior and middle femora and tibiae have a very distinct black stripe behind, on the hind legs the black is more abundant and more suffused.

*Hab.* Corvallis, Oregon: 5 ♀, May 21 to June 7; 1 ♂, April 27.

Received from Mr. Viereck.

*Nomada ultima*, sp. n.

♀.—Length 8 millim.

Like *N. oregonica*, but the third antennal joint is very much shorter than the fourth and the first abdominal segment above has black only at the sides of basal half, never in the middle. The anterior and middle femora and tibiae are red, entirely without markings, but the hind femora have a black stripe behind. The ventral surface of the abdomen is red, wholly without transverse blackish stains. Mandibles simple.

*Hab.* Corvallis, Oregon: 6 ♀, May to June 7.

Received from Mr. Viereck.

*Nomada Astori*, sp. n. (vel *ultima*, var.?).

♀.—Length about  $7\frac{1}{2}$  millim.

Red, with black markings; mandibles simple; abdomen without black bands or yellow spots; yellow at lower corners of face; third antennal joint half length of fourth; sides of abdomen inclined to be black-spotted. Antennae entirely

ferruginous. Superficially similar to *N. oregonica*, but besides the characters just given differs as follows:—Yellow streak on lower anterior orbits longer; sides of thorax with much less black; mesothorax with only one black band; abdomen with only the sides of first segment showing black (this as in *ultima*); dorsal surface of abdomen bright, but not shining coppery red, except in certain lights, when it has a silvery or even purplish lustre (in *oregonica* it is shining and ordinary). The head is transversely oval, as in *N. oregonica*.

The abdomen in *N. ultima* has the same peculiar appearance as that of *N. Astori*; it is possible that the latter is a variety of the former, but in my material *N. ultima* is easily distinguished by the three black bands on mesothorax and the yellow spots of the abdomen.

*Hab.* Corvallis, Oregon: 1 ♀, June; var. *a*, May 20, ♀.

Named after John Jacob Astor. Received from Mr. Viereck.

The specimen taken in May is smaller and has three bands on mesothorax and the first segment of the abdomen black right across at base; the third antennal joint is even shorter than in the type, being less than half the length of fourth. The abdomen is quite without yellow spots. This looks like a distinct species, but I leave it with this mention for the present.

*Nomada corvallisensis*, sp. n.

♀.—Length about 8 millim.

Dark ferruginous, with black markings; no yellow anywhere. Mandibles simple. Resembles *N. Astori*, but certainly a different species, readily distinguished by having no yellow at lower corners of face; having the third antennal joint at least as long as the fourth; the sides of the dark red abdomen without black marks, and the surface of the abdomen very distinctly punctured, which is not at all the case in *Astori*. Maxillary palpi with the fourth joint longest, but the third almost as long; the fifth and sixth very slender, the fifth conspicuously shorter than the fourth and the sixth than the fifth. Face with short white hair; occiput with tawny hair; scape black above apically; front and region of ocelli suffusedly blackened; mesothorax with a single broad median black stripe; scutellum and postscutellum dark red, but metathorax black; tegulæ shining coppery red, with very sparse punctures. Wings fairly clear, the broadly darkened apical margin strongly contrasting; stigma very dark reddish, nervures piceous; second submarginal cell broad above. Legs red, with little black, but the middle femora at base and the



hind femora behind are conspicuously blackened; hair on inner side of basal joint of hind tarsi pale golden; a trilobed black mark at base of first abdominal segment.

*Hab.* Corvallis, Oregon, May 24.

Received from Mr. Viereck.

Mr. Viereck has called my attention to a character of the venation which is useful for separating closely similar species of *Nomada*. Applied to the species above described it gives these results:—

- (1) Transverso-medial nervure joining discoidal nervure some distance from its base \* ..... *N. Clarkii*, *N. Grayi*,  
*N. oregonica*.
- (2) Transverso-medial nervure joining discoidal nervure very near to or at its base ..... *N. Lewisi*, *N. Astori*,  
*N. corvallisensis*, *N. ultima*, *N. erythrochroa*, *N. Fowleri*.

*Nomada aquilarum*, sp. n.

♂.—Length hardly 6 millim.

Black, with cream-coloured markings; abdomen broad and quite small. Facial quadrangle square, the orbits parallel; eyes pale grey; anterior half of clypeus, triangular lateral marks short and blunt above, and broad base of mandibles cream-colour; mandibles simple; labrum dark, very densely punctured; antennæ dark brown above, ferruginous beneath; third joint a little longer than fourth, paler and less shining than rest of flagellum; cheeks wholly black; mesothorax extremely densely punctured; the cream-coloured tubercles offer the only light marking on thorax; scutellum hardly bilobed; tegulæ testaceous, with a small cream-coloured spot. Wings irregularly stained with brown; nervures dark; transverso-medial nervure joining discoidal at its base. Legs black, anterior femora and tibiæ in front and anterior tarsi pale ferruginous; middle and hind tibiæ at base, spot near apex of middle tibiæ, and large wedge-shaped mark on apical portion of hind tibiæ cream-colour; hair on inner side of basal joint of hind tarsi very pale golden. Abdomen with shallow punctures; first segment black, second to fourth with a large wedge-shaped cream-coloured mark on each side, fifth and sixth with bands; posterior margins of third and following segments reddish; apical plate not at all

\* This is true also of the following species in the Cresson collection, as reported by Mr. Viereck:—*N. grandis*, *superba*, *Edwardsii*, *affabilis*, *jocularis*, *Morrisoni*, *civilis*, *electa*, *bella*, *lepida*, *vineta*, *vicinatis*, *bisignata*, *maculata*, *perplexa*, *pygmæa*, *melliventris*.

emarginate; apical portion of venter with three light bands, the first two very broadly interrupted in the middle.

The markings of the hind tibiæ and the immaculate metathorax suggest *N. verecunda*, which, however, is a different thing.

*Hab.* South Fork of Eagle Creek, White Mountains, New Mexico, about 8000 feet, at flowers of *Erigeron macranthus*, Aug. 18 (*C. H. T. Townsend*).

*Nomada beulahensis*, sp. n.

♂.—Length 6–8 millim.

Similar to *N. aquilarum*, but larger, and differing from the above description as follows:—Light markings bright lemon-yellow; anterior margin of clypeus only, and that notched in the middle, yellow; lateral marks narrowly pointed above, often produced some distance up orbital margin; a yellow band beneath eyes, not always developed; labrum yellow; scape yellow beneath; third antennal joint obviously shorter than fourth; tubercles black or with a ferruginous spot; scutellum usually with two ferruginous spots; tegulæ shining coppery; wings more uniformly smoky, but only the apex really dark; not only the anterior, but also the middle femora and tibiæ, ferruginous in front; apices of hind femora and tibiæ reddish; no yellow markings on legs; hair on inner side of basal joint of hind tarsi greyish brown; yellow bands on fourth and fifth abdominal segments with a rounded notch sublaterally behind; yellow on venter extending in spots and interrupted bands as far forwards as the second segment; apical plate strongly notched.

Allied to *N. interruptella*, Fowler.

*Hab.* Beulah, New Mexico, 8000 feet, August 1902, 4 ♀ (*Cockerell*); Chicorico Cañon, near Raton, N. M., Aug. 25, 1 ♀ (*Cockerell*).

*Nomada neomexicana*, sp. n. (vel *texana*, subsp.?).

♀.—Length about 8 millim.

Black, with yellow markings and bright ferruginous legs. Almost exactly like *N. texana*, Cresson (a Texas specimen sent by Mr. Fox compared), but differs as follows:—Mesothorax more coarsely sculptured (more like *N. modesta*); tegulæ orange-ferruginous; light markings pale lemon-yellow (considerably lighter than in *N. modesta*); ventral surface of abdomen wholly dark, except for two very short and minute light linear marks. The metathorax is without the yellow spots of *N. modesta*. Mandibles simple; third

joint of antennæ longer than fourth; transverso-medial nervure meeting basal, but a little on the externo-medial side.

♂.—Length about 9 millim., but more slender.

Differs from the male of *N. modesta* (a Colorado specimen sent by Mr. Fox compared) as follows:—Ventral surface of abdomen with no pale bands, but only four very inconspicuous short pale lines, on segments 3 and 4; yellow markings paler; no yellow spots on metathorax; band on second abdominal segment more narrowed in the middle; apical plate only feebly notched; legs red, the only light markings being cream-coloured spots on hind coxæ and hind tibiæ at apex; wings with a more distinct apical cloud.

Perhaps I ought to regard this as a subspecies of *N. texana*, but, though very close, it is readily distinguishable, and no intermediate specimens have been seen.

*Hab.* Deming, New Mexico, at flowers of *Verbesina encelioides*, July 9 (*Cockerell*); Rincon, N. M., at flowers of *Prosopis glandulosa*, July 5 (*Cockerell*). The first-mentioned locality produced the female, the second the male.

It is rather remarkable that in the *N. modesta* series the southern forms differ from the northern by the absence of the spots on the metathorax; thus, on the Pacific coast, the southern *N. formula*, Viereck, is essentially *N. suavis* without the metathoracic spots. I had arrived at this conclusion from a study of *N. formula* and the description of *suavis*; Mr. Viereck has now confirmed it by comparing the actual types.

*Nomada grindeliæ*, sp. n.

♂.—Length about  $6\frac{1}{2}$  millim.

Shining black, entirely without markings, but with short silvery-white hair, dense on face, labrum, pleura, middle and hind tibiæ, and patches at sides of abdomen. Mandibles largely ferruginous, simple, but broad at end. Eyes greyish black; facial quadrangle practically square; flagellum short and stout; third antennal joint longer than fourth; sides of vertex and of mesothorax smooth and shining; tegulæ dark brown. Wings nearly clear, with the apical margin broadly dusky; stigma black; transverso-medial nervure meeting basal; abdomen smooth and shining; apical plate broad and rounded, not in the least notched.

Allied to *N. pilosula*, Cresson, but the front is not narrowed above and the size is smaller.

*Hab.* Lincoln, Nebraska, on *Grindelia* flowers, Sept. 2, 1901 (*J. C. Crawford*).

Received from Mr. Viereck.

*Nomada aztecorum*, sp. n.

♀.—Length 11 millim. or rather more.

Black, with bright yellow markings. Head broad, but facial quadrangle not far from square; anterior half of clypeus, not extending to sides, yellow; yellow lateral face-marks broad below, narrowing upwardly to form a band on orbital margins reaching above level of antennæ as far as two thirds length of scape; no yellow below eyes, on cheeks, on labrum, or mandibles, but the latter have a ferruginous mark; a very small yellowish-red dot at summit of each eye; mandibles simple; labrum densely punctured, with a median smooth band, slightly elevated on the margin; face and front densely punctured; first three joints of antennæ (except the apical half of scape above) and apex of last joint bright red, the rest black, in strong contrast; third antennal joint barely longer than fourth; thorax extremely densely punctured, especially the dull mesothorax; margin of prothorax above, tubercles, spot on pleura, two pear-shaped spots on scutellum, post-scutellum, and two very small spots on metathorax yellow; scutellum not bilobed; tegulæ bright ferruginous, punctured. Wings strongly smoky, especially on apical margin; stigma dark reddish, nervures piceous; third submarginal cell unusually broad above; transverso-medial nervure meeting basal. Legs black and red, the tibiæ and tarsi with light golden pubescence; a spot on middle coxæ and a very broad **V** on hind coxæ yellow; femora largely black, tibiæ and tarsi red, the hind ones blackened behind; abdomen with a minute hardly noticeable punctuation, appearing rather as a minute roughening; black, with five yellow bands, the first narrowed to a point in the middle, the second narrowed about half; venter black, with two large yellow triangles, touching in the middle line, on second segment.

*Hab.* Amecameca, Mexico, September (*Barrett*).

Sent by Mr. Viereck, who received it from Mr. Titus. A very fine and distinct species.

*Nomada Vierecki*, sp. n.

♀.—Length about 7 millim.

Black and ferruginous, marked with cream-colour; mandibles simple; third antennal joint longer than fourth; transverso-medial nervure entering the end of the externo-medial. This has been erroneously recorded as *N. modesta*, but it differs conspicuously as follows:—Size smaller; light markings cream-colour instead of yellow; no light spots on meta-

thorax; clypeus black or dark reddish; lower corners of face often reddish; lower part of prothorax, a variable amount of pleura, and metathorax except enclosure red; abdomen with a variable amount of red, always including the base of first segment dorsally and basal half of venter; punctures of mesothorax well separated on a shining ground; ventral surface of abdomen with two light bands, on segments 3 and 4; cream-coloured marks on hind coxæ and hind tibiæ at apex, and sometimes at base. Also similar to *N. Heiligbrodtii*, Cresson, but smaller and differing in various details.

♂.—Length 7 millim. Similar to the female, but some yellowish white on scape beneath and at apex of hind femora; face up to level of antennæ, and higher at sides, yellowish white; apical plate deeply notched.

*Hab.* Juarez, Mexico, May 12, 1 ♂ (*Cockerell*): Las Cruces, New Mexico, 2 ♀, May 10, 11; 1 ♂, May 11 (*Townsend*): Mesilla, N. M., July 25, 1897, at flowers of *Aster spinosus*, 1 ♀ (*Cockerell*): Mesilla Park, N. M., May 7, at flowers of *Dithyrea Wislizenii*, 1 ♀, 2 ♂; May, 1 ♂ (*Townsend*); May 9, on foliage of poplar, 1 ♂ (*Cockerell*).

Named after Mr. H. L. Viereck, in recognition of his work on New Mexico bees.

*Nomada crucis*, sp. n. (vel *texana*, subsp.?).

♂.—Length 7 millim.

Black, with bright yellow markings and red legs; quite like *N. Vierecki*, except in the colour of the markings, the coarsely, densely, and confluent sculptured mesothorax, the longer antennæ, and the strongly testaceous hind margins of abdominal segments 2 to 5. The only red about the thorax is on the hind part of the metathorax. Apical plate of abdomen deeply emarginate. Also formerly confused with *N. modesta*, but is smaller and without the metathoracic spots.

*Hab.* Las Cruces, New Mexico, August 11 &c., 4 ♂ (*Townsend*); Deming, N. M., at flowers of *Verbesina encelioides*, July 9 (*Cockerell*).

This may possibly be a variety of *N. neomexicana*, but it is smaller and more compact, with a shorter abdomen, the ventral surface of which has two pale bands. By the latter character it agrees with *N. texana*, to which it is extremely similar; but although the insect is smaller, the mesothoracic punctures are larger (from middle line to margin near tegulæ 11 or 12 in *crucis*, 14 or 15 in *texana*), and not so close on the disk. In *N. crucis* the transverso-medial nervure joins



the end of the externo-medial; in *texana* it exactly meets the basal.

It is proper to state that my interpretation of *texana* depends upon a specimen from the collection at the Philadelphia Academy, which to all appearances is one of the original fourteen from which Cresson described. However, my specimen has the venter of abdomen black, with a red spot on first segment and conspicuous, narrowly interrupted, yellowish-white bands on segments 3 and 4; whereas Cresson says "venter varied with ferruginous, the third segment generally with a yellow spot on each side."

*Nomada sophiarum*, sp. n.

♂.—Length  $8\frac{1}{2}$  millim.

Black, with very pale yellow markings and red legs; more hairy than usual, the pubescence silvery white, dense and appressed on face, and giving the abdomen a pruinose appearance. Facial quadrangle longer than broad, slightly narrowed below; eyes light green; mandibles except tips, labrum, and face up to level of antennæ (except a little black below antennæ) light yellow, the lateral marks ending abruptly at level of antennæ; the usual small spots on margin of clypeus; no yellow behind eyes; mandibles simple, extremely broad at base; scape cylindrical, much swollen, black above, light yellow beneath; third antennal joint conspicuously shorter than fourth; flagellum orange, black or blackish above on joints 3, 4, 5, and 11, joints somewhat crenulated, the apical one (13) pointed; mesothorax with extremely dense large punctures, much covered by hair in front; margin of prothorax above, tubercles, irregularly semilunar mark below, tegulæ, two small spots at anterior corners of scutellum, and two small marks on postscutellum light yellow. Wings unusually clear, the apical margin dusky, and the light spot distinct; stigma ferruginous, nervures fusco-ferruginous; second submarginal cell broad above; transverso-medial nervure meeting basal. Legs light red, hind coxæ and femora black behind except at apex; hair on tarsi pale golden; abdomen rather long, first segment red, with the base black, and a pair of small black marks about the middle subdorsally; remaining segments black, with very broad pale yellow bands, not or hardly narrowed in the middle; punctures of abdomen close and distinct; apical plate red, very feebly notched; venter red, with much black on first, fourth, and fifth segments.

*Hab.* Mesilla Park, New Mexico, April 16, at flowers of *Sophia* (Cockerell).

The *Sophia* was probably *S. andrenarum*, but perhaps *S. halictorum*; the two species had not then been distinguished.

*Nomada lippie*, sp. n.

♂.—Length about  $8\frac{1}{2}$  millim.

Black, with very pale yellow markings and red legs; only slightly pubescent, the face shining, with well-separated punctures, and quite bare. Facial quadrangle somewhat broader than long; eyes grey; broad base of mandibles, labrum except blackish stain in middle, clypeus except posterior margin, square supraclypeal spot (surrounded by black), lateral face-marks, and minute spot at top of eyes behind light yellow; the lateral face-marks are broad, ending abruptly halfway between level of antennæ and tops of eyes, and nearly divided below by a black stripe running from the clypeus towards the eye; antennæ slender, ferruginous below and black above; scape unusually long and narrow; third antennal joint very much longer than fourth; mesothorax closely punctured, but shining; upper margin of prothorax, tubercles, a minute anterior and a large posterior spot on pleura, two large contiguous spots on scutellum, and band on postscutellum very light yellow; tegulæ light red, with a cream-coloured spot. Wings with lower half almost clear, upper half dusky except at base, very strongly so apically; stigma ferruginous, nervures fuscous; transverso-medial nervure meeting basal, but a little on the externo-medial side. Legs bright red, shining; a spot on hind tibiæ at end and a stripe on basal joint of hind tarsi cream-colour; hair on hind tarsi silvery; abdomen rather long and tapering, shining, but distinctly punctured, brown-black, with very pale yellow bands on segments 1, 2, 4, and 5, that on 4 much narrowed and slightly interrupted in the middle; third segment with a transversely oval spot on each side and a dot mesad of it; apical plate dark brown, rounded, not in the least emarginate; ventral surface very dark brown, with a transverse yellowish band on segment 3, not produced to the sides.

*Hab.* La Cueva, Organ Mts., New Mexico, about 5300 feet, at flowers of *Lippia Wrightii*, Sept. 5 (C. H. T. Townsend).

East Las Vegas, New Mexico, U.S.A.,  
April 15, 1903.

P.S.—Mr. Viereck writes that all the specimens of *Nomada* from Corvallis, Oregon, were collected by Prof. Arthur B. Cordley and his students. Prof. Cordley sent them to Mr. Bradley, who handed them to Mr. Viereck.